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UNITED STATES DEPARTMENT OF AGRICULTURE

The ARGENTINE ANT as a HOUSEHOLD PEST

FROM TEXAS TO THE ATLANTIC, in scattered localities, the Argentine ant, in dark brown hordes, attacks gardens, ruining orchard and truck crops, and swarms into the houses, making conditions in some cases so unbearable that their inhabitants leave.

The pest is carried by rail in foodstuffs, and since its original introduction, presumably from Brazil, it has been distributed about the country until infestations occur throughout the South, with a separate group of infestations in California. It may also be carried by floods, such as take place in the Mississippi Valley, the ants forming themselves into a compact ball which floats to safety.

In the warm spring weather the Argentine ant is particularly annoying in households, and thorough methods for its control should be undertaken at that time. On page 6 will be found a formula for a tree-banding mixture that will protect the trees of the nurseryman and orange grower. Various methods for isolating food in the house and a satisfactory ant poison to be used as a protection within doors and without are also described.

Contribution from the Bureau of Entomology
L. O. HOWARD, Chief
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THE ARGENTINE ANT[1] AS A HOUSEHOLD PEST.

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A PEST BOTH IN THE HOUSEHOLD AND ON THE FARM.

ANTS are common and annoyance from them is by no means unknown, yet the Argentine ant has distinguished itself by greatly exceeding other species in its injury. Other ants may make themselves troublesome, but the Argentine ant goes so far as to cause homes to be vacated in an infested neighborhood. It becomes important in agriculture as well, damaging fruit and other crops by its propagation of scale insects.

The worker ants are most commonly seen. Small in size and dark brown in color, they are able to invade practically every part of ordinary dwellings, stores, etc. The Argentine ant is almost omnivorous, eating most cooked foods and a considerable percentage of the raw foods found in the average pantry. It has a marked preference for some things, such as sugar, sirup, honey, jams, cakes, candies, pies, fruit, and meats of all kinds. Even refrigerators and ice boxes are readily invaded, the low temperatures having no deterrent effect. It is a common occurrence for Argentine ants to find their way into bedchambers, and while they do not possess a sting they can cause considerable pain with their mandibles. There have been many reports of babies being attacked by them in such numbers as to cause serious results; several of these reports have been verified.

With conditions made almost intolerable in badly infested places, it is not uncommon to find empty, unrentable houses. Realty values accordingly drop.

[1] *Iridomyrmex humilis* Mayr.

IMPORTANCE IN AGRICULTURE.

The nurseryman, the trucker, and the orange grower are greatly molested by this pest, owing to the fondness of the ant for the honeydew excreted by aphids and scale insects. The workers take the best possible care of these honeydew-yielding species, and protect them from their natural enemies, frequently building shelters over them, and as the host plants grow, carry the young scales and aphids and place them on the young tender growth, where they may more easily sap the juices of the plants.

In corn, cotton, and sugar-cane fields, the Argentine ant when present is constantly attending the aphids and mealybugs, increasing the numbers of these species to an alarming degree, much to the detriment of the plants. The writer estimates that a considerable loss of sugar results from the attendance of the Argentine ant on the sugar-cane mealybug.

NESTING HABITS.

Argentine ants are extremely social among their own kind, the individuals never having been observed to quarrel with one another, nor one colony with another. Workers may be carried for miles and placed with others of their kind and no apparent demonstrations of like or dislike are exhibited. The newcomers appear to enter into the colony spirit and are soon lost to the view of an observer. Any small nest will contain several queens which live together amicably.

The summer nest may be located anywhere—under sidewalks, under the sills of houses, in brick piles, stone piles, under a piece of board or a piece of tin, in an old tin can—in fact, in any place convenient to the food supply. In the winter months there is a tendency to concentrate into larger colonies, and they seek warm, dry, secure nesting places in which to hibernate. These desirable places are not plentiful, and where one is located the ants from some distance will seek its shelter. The winter is the most hazardous period of the year, for should a nest by any chance be flooded during a cold spell, when the ants are dormant, the chances of survival of the colony would be extremely slight. Usually throughout the latter part of December, January, and February (at New Orleans) these large colonies are found. They sometimes reach very extensive proportions and may contain several hundred queens and countless workers and immature stages. These colonies are usually located at the base of large trees on high, well-drained spots of ground, in manure piles, or in any other piles of decomposing rubbish where heat is generated. A warm day will make them particularly active, and they will form trails in all directions from these winter nests to food supplies. They may be observed traversing the trunks of trees every warm winter

day, and from the trees trails are made to near-by houses, where they cause considerable annoyance.

With the advent of warm spring weather the breaking up of the large colonies occurs. This is the time of the year that food is very scarce, and at this season the ants are particularly aggressive and troublesome in the houses.

SCATTERED FROM TEXAS TO THE ATLANTIC, WITH INFESTATIONS IN CALIFORNIA.

Introduced years ago, probably on coffee ships landing at New Orleans from Brazil, the Argentine ant has been carried about the country in foodstuffs, until it now occurs in scattered localities throughout the South, the present northern limit being Nashville, Tenn. The farthest infestation in the East is Wilmington, N. C., while in the West it is found in several cities of central Texas, including Dallas, Fort Worth, and Houston. There is also a separate group of infestations in California.

HOW NEW TERRITORY IS GAINED.

Inspections indicate that when carried long distances the ants were more likely taken through on carload lots of foodstuffs which were rushed to their destination than along with smaller consignments. Arriving with the large shipments, they probably gained a foothold in the wholesale districts of such cities as Memphis and Atlanta, and from these centers were disseminated with small shipments to the surrounding towns.

There is also a normal extension of the territory occupied by the Argentine ant. This is 300 to 400 feet per year, and depends on the food supply and the abundance of other ants, the Argentine species waging a continuous warfare on native ants until the latter are entirely killed out.

To establish an infestation it should be noted that it is necessary for a gravid queen (egg-laying female) to be present. It is quite possible that into almost every town and city in the southern States there has been introduced at one time or another a number of workers, but as these are incapable of reproduction a colony has not become established.

THE NEST FLOODED, A COLONY MAY FORM A COMPACT BALL AND FLOAT AWAY.

Though the principal method of infesting new teritory is by rail, the Argentine ants are occasionally transported by high water. They are carried in lumber, rotting trees, uprooted shrubs, fruit,

vegetables, etc., which may be swept from one location to another by a swollen stream. Even without such means of riding to safety, a flooded colony may not suffer extinction by drowning. The species has a remarkable habit of self-preservation in times of floods, for when rising water floods a nest, and no other way of escape is presented, the ants may cluster together and form a compact ball. The immature stages cluster at the center of this mass, while the queens and workers form the outer portion. As the ball enlarges by the addition of other workers which have been struggling alone in the water it gradually revolves. It is kept revolving slowly by the outside workers continually striving to reach the top of the ball, thus permitting air to reach the interior. The ants in these balls disperse when they come into contact with a secure resting place, but they may float about on still water for hours.

VARIOUS FORMS.

As with other ants, there are several distinct forms in a colony. The queen is a sexually perfect female, capable of depositing eggs. In one colony a number of queens may be present. The males or drones have apparently only the function of fertilizing the queens. The workers, foragers of the colony, are imperfect females with no reproductive functions. Besides these adult forms, there are usually eggs and other immature stages in a nest. (Fig. 1.)

CONTROL.

NATURAL CONTROL NOT EFFECTIVE.

Though sudden heavy rains, especially when combined with low temperatures in winter, reduce the numbers of the Argentine ant, it has been found that it is only a question of months before the normal infestation is regained. Other forms of natural control are of still less importance.

HOW TO KEEP ANTS FROM TREES.

Woglum and Neuls[1] recommend the following tree-banding mixture for keeping the ants from crawling up trees:

Finely powdered flowers of sulphur_____part by weight__ 1
Commercial tree-banding sticky material_____parts by weight__ 6

The two ingredients are mixed together thoroughly with a wooden paddle until of a uniform color and consistency. The tree trunk should first be coated with melted paraffin, which will harden almost immediately. The mixture just

[1] Woglum, R. S., and Neuls, J. D. The Common Mealybug and Its Control in California. U. S. Dept. Agr. Farmers' Bul. 862. 1917.

referred to should then be applied over the paraffin in a band about 5 inches wide and about one-fourth inch thick.

Before the band is applied the tree should be pruned so that the lowest branch is fully a foot above the ground, and all rubbish should be removed from beneath the tree and the soil cultivated to destroy all grass and weeds.

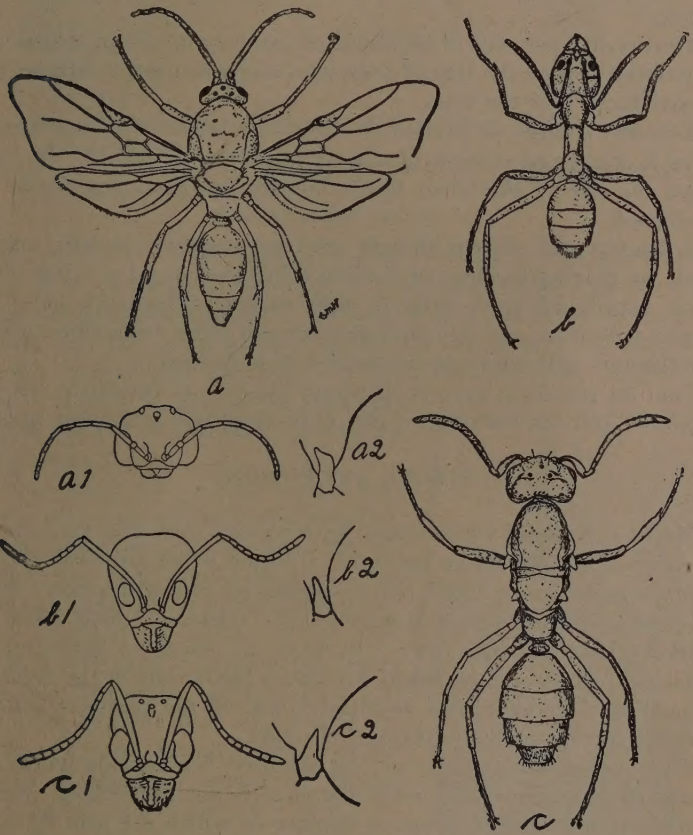

FIG. 1.—The Argentine ant, adult forms: *a*, Adult male; *a1*, head of male; *a2*, petiole of male; *b*, worker; *b1*, head of worker; *b2*, petiole of worker; *c*, fertile queen; *c1*, head of queen; *c2*, petiole of queen. All greatly enlarged. (Newell and Barber.)

HOW TO KEEP ANTS FROM TABLES, ETC., IN AN INFESTED HOUSE.

Perhaps the most effective and durable barrier which can be used indoors is a bichlorid-of-mercury tape or band. Tape is soaked in a saturated solution of bichlorid of mercury and then hung up to dry. It is then placed around the legs of tables, safes, etc., and if it is kept dry will last from six months to a year. Common lampwick one-half

an inch wide is ideal for this purpose. After it has been treated in a saturated solution of bichlorid of mercury and dried, pieces are wrapped around the leg of the piece of furniture to be isolated and ends lapped over tightly and pinned. The tape can be readily renewed by another soaking in bichlorid of mercury and repinned in place.

Twenty-five per cent of bichlorid of mercury mixed in shellac may be painted around the legs of furniture, and when dry it will be quite as satisfactory as the tape.

Extreme caution is advised in handling bichlorid of mercury, as there is always an element of danger in using this poison. In recent years the sale of this drug to the layman has been practically discontinued.

A simple and efficient though perhaps unsightly barrier may be made by placing the legs of furniture in saucers and putting a generous supply of moth balls in each saucer. The moth balls will slowly volatilize, and it is necessary to add more from time to time, but the ants will not cross the barrier thus formed.

Coal oil placed in saucers in which the legs of furniture rest will repel the ant, but the odor of the oil is disagreeable to most persons.

STRONG ANT POISONS.

Many and varied experiments have proved that it is futile to try to exterminate Argentine ants with a poison which kills rapidly. A few workers may be killed, but the masses of ants will quickly recognize the source of fatality and avoid the "doctored" food. The few workers killed in this way will have no effect in reducing the numbers. None of this poison will reach the queens in the nest, and it has been found that it is essential to kill off the queens in order to prevent further multiplication of the pest.

Such poisons are, however, satisfactory for quickly ridding a house of ants, though the relief obtained is not permanent. Strong antimony or arsenical sirups, a number of which are sold by druggists in infested territory, are used for this purpose. They are usually placed about the infested house in small dishes, a few drops to a dish. Though the ants feed on such a sirup at first, they soon realize that it is harmful and vacate the building for a few weeks.

A SIRUP MADE ACCORDING TO A SPECIAL FORMULA MOST SATISFACTORY.

A weakly poisoned sirup, on the other hand, may be continually attended, the workers carrying it to the nest and feeding it to the

queen and the larvæ, eventually exterminating the entire colony. A special poisoned sirup[1] has been devised. It is prepared as follows:

Granulated sugar	pounds	9
Water	pints	9
Tartaric acid (crystallized)	grams	6
Benzoate of soda	grams	8.4
Boil slowly for 30 minutes. Allow to cool.		
Dissolve sodium arsenite (C. P.)	grams	15
In hot water	pint	½
Cool. Add poison solution to sirup and stir well. Add to the poisoned sirup:		
Honey	pounds	1¼
Mix thoroughly.		

APPLICATION OF THE SIRUP.

On account of the ants continuing to feed on a weakly poisoned sirup, it is desirable to place it in cans or paraffined paper bags *outside* of the infested house. The ants will be attracted away from the house by the sirup on the outside, not temporarily driven away through fear as they are by a strongly poisoned sirup within the house. Within a day or so after the sirup is put out no ants should be found in the house.

It may happen from time to time that some of the cans will be found deserted. This is often because the ants are attracted by other food, especially the honeydew given off by aphids and mealybugs. During the middle of the summer it is very hard to attract them away from this honeydew, which is their natural food, and for this reason it is desirable to poison them during the cooler months of the year, especially during early spring, when there are fewer insects to supply them with a food substance which is more attractive than the purest sirup. Houses, however, may be freed from ants during midsummer by the use of the sirup made according to the formula given above.

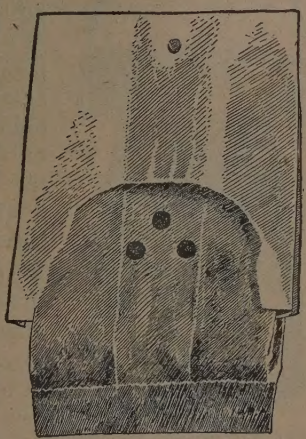

FIG. 2.—Paraffined paper bags arranged as a container for ant-poison sirup. The apron has been cut away to show entrance holes. Such bags are nailed to trees.

The paraffin-covered paper bag shown in figure 2 is undoubtedly the cheapest container. It can be made in large quantities at a cost of about $5 per thousand. Small 1-pound bags used in grocery stores are obtained, and two or three holes about one-fourth inch in diame-

[1] Accuracy in the use of the specified ingredients and weights is necessary if successful results are to be secured.

ter are cut through each folded bag with a leather-punch or similar instrument. This provides each bag with two or three holes on each side for the entrance of the ants. Being opened, the bags are dipped in a pan of molten paraffin and set aside to dry. The paraffin, forming a waterproof surface, materially lengthens the life of the bag, which is protected from the entrance of water through the holes by part of another (2-pound) paraffined bag which covers the first one like a canopy. In use, each bag is provided with a small quantity of poisoned sirup and a piece of sponge, the protecting outer piece of bag is drawn over it, and the ends of both are folded over at the top and tacked to a tree. On account of the bag coming together at the top it is very narrow at the point where the entrance holes are made; consequently very small pieces of sponge are required. The bags have been known to last for long periods, but the larger percentage of them last only about two or three months. They can not be recharged.

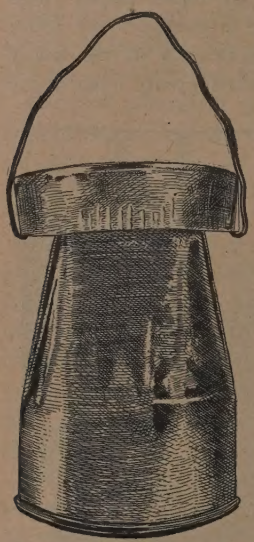

FIG. 3.—Tin can container for ant-poison sirups used in outdoor experiment.

The tin can shown in figure 3 is the most satisfactory container. Any sized can may be used, but the handiest size is the one-half pound baking-powder can. The can must have a friction cover, and of course it must hold water. If the can is indented deeply on the two opposite sides (as illustrated in the drawing, fig. 3) and the cover replaced, it will be observable that there is ample space between the top of the can and the cover for the entrance of the ants, and the can, if kept in an upright position, will be weatherproof. About a gill of the sirup will be sufficient for several months, but in heavy infestations it is better to put 2 gills in each can. It is very advisable to place a fairly large piece of sponge in the can. The sponge will float on the sirup and allow the ants to feed in large numbers. A piece of wire about 6 inches long may be bent for a handle, a hook inward at each end being made. The hooks may be attached under the lid of the can where it projects over the part that has been indented. This forms a handle by which the cans may be hung on trees, fences, walls of houses, etc. The ants prefer to climb for their food, and it is well to hang the cans near ant trails going up trees, walls, etc. It is advisable to hang the cans in the shade to prevent the evaporation of the sirup, for though it has been proved that evaporation does not affect this sirup to a marked extent, it is well to avoid raising the solid contents of the liquid. Eight to ten of these

cans should be sufficient to place around an ordinary city house and lot. If the grounds are large and if many trees are present, more cans should be placed out.

From the results so far obtained, the careful preparation of the poisoned sirup can not be too highly emphasized. Very accurate balances are necessary for the weighing out of the poison and the tartaric acid. This is especially true when small quantities of the sirup are prepared.

PLANS FOR MUNICIPAL CONTROL WORK.

In effecting control in towns and cities it is first necessary to ascertain the extent of the infestation. This should be mapped out so that workmen in distributing the cans will be able to refer to the map to insure the covering of the entire territory. Cans may be obtained at wholesale at about $16 per thousand.[1] About 10 pounds of "grass" sponges will be required per 1,000 cans. These will cost about 75 cents per pound. The sponges should be thoroughly washed and dried before use. When wet they may be easily torn into pieces about 2 by 2 inches. Using 1 gill of sirup per can, 200 pounds of granulated sugar will be required per 1,000 cans. The cost of the sodium arsenite is about 80 cents per pound, and 1 pound will be sufficient for 1,500 cans. Tartaric acid (crystallized) costs about 70 cents a pound, which will be enough for 4,500 cans. From 60 to 100 cans will be required per block, depending on the size of the block. The late fall, winter, and spring are the most desirable times in which to do this work, as in these seasons the natural food is least plentiful and the ants most hungry. Two men should be able to prepare the sirup, wash and tear up the sponges, and charge about 2,000 cans per day and distribute about 1,000 cans per day.

TRAPPING ANTS.

By taking advantage of their winter colonizing habits the ants may be attracted in large numbers to specially prepared trap boxes, which may be fumigated when large numbers have gathered in these boxes for winter nesting. The boxes should be filled with decaying vegetation, the heat generated making them very attractive as hibernating quarters. Carbon disulphid was found to be the best and most economical fumigant for use in the trap boxes. It is hardly necessary to state that this method of control is not applicable to city conditions, where dry nesting quarters are very plentiful and the ants do not colonize to any great extent.

[1] The cost figures given in this paragraph are approximately normal. Present war prices are probably higher for each item.

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